WHAT IS CLAIMED IS:

1. A discrete wavelet transform (DWT) unit for encoding and decoding a still image, comprising:

an energy calculating section for calculating energy of an input image in a unit of a block having a predetermined number of pixels;

an image decomposing section for performing three-level decomposition of the image of the block by decomposing a band, at which a low frequency component is distributed three times; and

a coefficient substituting section for substituting 0 (zero) for bands, at which a high frequency component is distributed, among the three-level decomposed bands.

2. A discrete wavelet transform (DWT) unit according to claim 1, wherein the energy calculating section calculates the energy in a unit of the block as follows:

$$P_{MB} = \frac{1}{R^2}\sum_{x=0}^{R-1}\sum_{y=0}^{R-1} S \log S$$

where P_{MB} : energy of the image in unit of the block,

R : pixel size of the image, and

$S = |f(x,y) - E(f)|$,

where $f(x,y)$: value of the corresponding pixel of the image, and

$E(f)$: mean value of all the pixels of the image within the block.

3. A discrete wavelet transform (DWT) unit according to claim 1, further comprising a sub-sampling section for performing sub-sampling of reducing a pixel size of the input image by half before the energy calculating section calculates the energy of the input image.

4. A discrete wavelet transform (DWT) unit according to claim 1, wherein:

the image decomposing section equally divides a range between maximum and minimum values of the energy calculated by the energy calculating section into three equi-partitioned ranges, and divides the three equi-partitioned ranges into a first energy level, a second energy level and a third energy level in an order of a magnitude of the energy; and

the coefficient substituting section substitutes 0 (zero) for a coefficient of at least one band in which the high frequency component is distributed among the three-level decomposed bands according to the range to which a value of the energy of the corresponding block belongs.

5. A discrete wavelet transform (DWT) unit according to claim 4, wherein, when the energy value of the corresponding block belongs to the first energy level, the coefficient substituting section substitutes 0 (zero) for a coefficient of a band 1HH of the three-level decomposed bands.

6. A discrete wavelet transform (DWT) unit according to claim 4, wherein, when the energy value of the corresponding block belongs to the second energy level, the coefficient substituting section substitutes 0 (zero) for coefficients of bands 1HH, 1HL and 1LH of the three-level decomposed bands.

7. A discrete wavelet transform (DWT) unit according to claim 4, wherein, when the energy value of the corresponding block belongs to the first energy level, the coefficient substituting section substitutes 0 (zero) for coefficients of bands 1HH, 1HL, 1LH and 2HH of the three-level decomposed bands.

8. A discrete wavelet transform (DWT) unit according to claim 4, wherein, when the energy value of the corresponding block is a negative value, the coefficient substituting section substitutes 0 (zero) for coefficients of bands 1HH, 1HL, 1LH, 2HH and 3HH of the three-level decomposed bands.

9. A discrete wavelet transform (DWT) unit for encoding and decoding a still image, comprising:

an energy calculating section for calculating energy of an input image in a unit of a block having a predetermined number of pixels;

an image decomposing section for performing adaptive variable-level decomposition of a corresponding block according to a magnitude of energy value calculated in a unit of the block; and

a coefficient substituting section for substituting 0 (zero) for bands, at which a high frequency component is distributed among the adaptive variable-level decomposed bands based on an energy value of the corresponding block and performing image reconstruction.

10. A discrete wavelet transform (DWT) unit according to claim 9, further comprising a sub-sampling section for performing sub-sampling of reducing a pixel size of the input image by half before the energy calculating section calculates the energy of the input image.

11. A discrete wavelet transform (DWT) unit according to claim 9, wherein the corresponding block decomposed by the image decomposing section is adaptively preformed by any one of one-level decomposition, two-level decomposition and three-level decomposition.

12. A discrete wavelet transform (DWT) unit according to claim 11, wherein the image decomposing section equally divides a range between maximum and minimum values of the energy calculated by the energy calculating section into three equi-partitioned ranges, and sets the three equi-partitioned ranges into a first energy level, a second energy level and a third energy level in an order of a magnitude of the energy, and determines a decomposition level according to which level the energy level of the corresponding block belongs to.

13. A discrete wavelet transform (DWT) unit according to claim 12, wherein, according to the range to which the energy value of the corresponding block belongs, the coefficient substituting section substitutes 0 (zero) for a coefficient of at least one band, at which a high frequency component is distributed, among the adaptive variable-level decomposed bands.

14. A discrete wavelet transform (DWT) unit according to claim 13, wherein, when the energy value of the corresponding block belongs to the third energy level, the image decomposing section performs one-level decomposition of the corresponding block, and the coefficient substituting section substitutes 0 (zero) for a coefficient of a band 1HH of the one-level decomposed bands.

15. A discrete wavelet transform (DWT) unit according to claim 13, wherein, when the

energy value of the corresponding block belongs to the second energy level, the image decomposing section performs one-level decomposition of the corresponding block, and the coefficient substituting section substitutes 0 (zero) for coefficients of bands 1HH, 1HL and 1LH of the one-level decomposed bands.

16. A discrete wavelet transform (DWT) unit according to claim 13, wherein, when the energy value of the corresponding block belongs to the first energy level, the image decomposing section performs two-level decomposition of the corresponding block, and the coefficient substituting section substitutes 0 (zero) for coefficients of bands 1HH, 1HL, 1LH and 2HH of the two-level decomposed bands.

17. A discrete wavelet transform (DWT) unit according to claim 13, wherein, when the energy value of the corresponding block belong to a negative value, the image decomposing section performs three-level decomposition of the corresponding block, and the coefficient substituting section substitutes 0 (zero) for coefficients of bands 1HH, 1HL, 1LH, 2HH and 3HH of the three-level decomposed bands.

18. A method for reconstructing a still image using a discrete wavelet transform (DWT) unit for encoding and decoding the still image, the method comprising the steps of:

a) calculating energy of an input image in a unit of a block having a predetermined number of pixels at an energy calculating section;

b) performing three-level decomposition of a band, at which a low frequency component is distributed, relative to the image of the block at an image decomposing section; and

c) substituting 0 (zero) for bands, at which a high frequency component is distributed, among the three-level decomposed bands to reconstruct the image at a coefficient substituting section.

19. A method according to claim 18, wherein, in step (a), the energy is calculated in a unit of the block as follows:

$$P_{MB} = \frac{1}{R^2}\sum_{x=0}^{R-1}\sum_{y=0}^{R-1} S \log S$$

where P_{MB} : energy of the image in unit of the block,

R : pixel size of the image, and

$S = |f(x,y) - E(f)|$,

where $f(x,y)$: value of the corresponding pixel of the image, and

$E(f)$: mean value of all the pixels of the image within the block.

20. A method according to claim 18, further comprising a step of performing sub-sampling of reducing a pixel size of the input image by half at a sub-sampling section before step (a).

21. A method according to claim 18, wherein:

in step (b), a range between maximum and minimum values of the calculated energy is equally divided into three ranges to be set into a first energy level, a second energy level and a third energy level in an order of a magnitude of the energy; and

in step (c), a coefficient of at least one band at which the high frequency component is distributed among the three-level decomposed bands is substituted by 0 (zero) according to the range to which a value of the energy of the corresponding block belongs.

22. A method according to claim 21, wherein in step (c), when the energy value of the corresponding block belongs to the first energy level, a coefficient of a band 1HH of the three-level decomposed bands is substituted by 0 (zero).

23. A method according to claim 21, wherein in step (c), when the energy value of the corresponding block belongs to the second energy level, coefficients of bands 1HH, 1HL and 1LH of the three-level decomposed bands are substituted by 0 (zero).

24. A method according to claim 21, wherein in step (c), when the energy value of the corresponding block belongs to the first energy level, coefficients of bands 1HH, 1HL, 1LH and 2HH of the three-level decomposed bands are substituted by 0 (zero).

25. A method according to claim 21, wherein in step (c), when the energy value of the corresponding block is a negative value, coefficients of bands 1HH, 1HL, 1LH, 2HH and 3HH of the three-level decomposed bands are substituted by 0 (zero).

26. A method for reconstructing a still image using discrete wavelet transform (DWT) unit for encoding and decoding the still image, the method comprising the steps of:

calculating energy of an input image in unit of a block of a predetermined number of pixels at an energy calculating section;

performing adaptive variable-level decomposition of the corresponding block according to a magnitude of energy value calculated in a unit of the block at an image decomposing section; and

substituting 0 (zero) for bands at which a high frequency component is distributed among the adaptive variable-level decomposed bands based on an energy value of the corresponding block and performing image reconstruction at a coefficient substituting section.

27. A method according to claim 26, further comprising a step of performing sub-sampling of reducing a pixel size of the input image by half before the energy is calculated in step (a).

28. A method according to claim 26, wherein the corresponding block decomposed in step (b) is adaptively preformed by any one of one-level decomposition, two-level decomposition and three-level decomposition.

29. A method according to claim 28, wherein in step (b), a range between maximum and minimum values of the calculated energy is equally divided into three ranges to be set into a first energy level, a second energy level and a third energy level in an order of a magnitude of the energy, and a decomposition level is determined according to which level the energy level of the corresponding block belongs to.

30. A method according to claim 29, wherein in step (c), a coefficient of at least one

band, at which a high frequency component is distributed, among the adaptive variable-level decomposed bands is substituted by 0 (zero) according to the range to which the energy value of the corresponding block belongs.

31. A method according to claim 30, wherein, when the energy value of the corresponding block calculated in step (a) belongs to the third energy level,

the corresponding block is subjected to one-level decomposition in step (b), and

a coefficient of a band 1HH of the one-level decomposed bands is substituted by 0 (zero) in step (c).

32. A method according to claim 30, wherein, when the energy value of the corresponding block calculated in step (a) belongs to the second energy level,

the corresponding block is subjected to one-level decomposition in step (b), and

coefficients of bands 1HH, 1HL and 1LH of the one-level decomposed bands are substituted by 0 (zero) in step (c).

33. A method according to claim 30, wherein, when the energy value of the corresponding block calculated in step (a) belongs to the first energy level,

the corresponding block is subjected to two-level decomposition in step (b), and

coefficients of bands 1HH, 1HL, 1LH and 2HH of the two-level decomposed bands are substituted by 0 (zero) in step (c).

33. A method according to claim 30, wherein, when the energy value of the corresponding block calculated in step (a) belongs to a negative value,

the corresponding block is subjected to three-level decomposition in step (b), and

coefficients of bands 1HH, 1HL, 1LH, 2HH and 3HH of the three-level decomposed bands are substituted by 0 (zero) in step (c).